MIXER

SAMSON®

S8 / S6

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Introduction

Congratulations on purchasing the Samson S8/S6 Mixer Amplifier! In this manual, we'll take you on a guided tour through all the features of this powerful and flexible device, and we'll tell you how to get the most out of the S8/S6. Although designed for easy operation, we suggest you take some time out first to go through these pages so you can fully understand how we've implemented a number of unique features.

The S8 and S6 both combine a flexible multi-channel mixer with a clean, powerful amplifier and high-quality spring reverb unit—all in a single compact chassis that mounts easily in any standard 19" rack. Simply plug in your microphones and line-level instruments (such as keyboards, tape decks, CD players, etc.) and connect the unit to any standard speaker system, and you've got a complete PA system suitable for use in permanent installations such as churches, conference rooms, small clubs, or similar environments.

The S8 and S6 differ in the number of input channels (the S8 has eight while the S6 has six), the type of equalization (the S8 provides four bands per channel, while the S6 has three), their amplifier power ratings (the S8 delivers 300 watts into 4 ohms, while the S6 delivers 210 watts into 4 ohms), the number of Effects returns (the S8 has four while the S6 has two) and the presence or absence of a master metering section, peak LEDs, and headphone preamplifier (the S8 has all of these while the S6 does not). Both units include a 10-band graphic master equalizer, a master level control, phantom power, two Effects sends, and a Monitor output as well as dedicated tape/CD input.

In these pages, we'll begin with an overview of the main S8/S6 features, followed by a guided tour of both units' front and rear panels. Then we'll describe the various input and output connections (including wiring diagrams) and tell you in detail how to set up your S8/S6 as well as showing you how best to use the unit in live performance. Finally, we'll cover a number of specific topics (such as grounding techniques, using equalization, and using the effects sends and returns) and then wrap things up with full specifications.

Oh, and one last thing—don't forget to fill out and mail in the enclosed warrantee card! This will enable you to receive online technical support and will allow us to send you updated information about other Samson products in the future.

S8/S6 Features

The Samson S8/S6 utilizes state-of-the-art technology in integrated mixer/amplifier design. Here are some of its main features:

- Standard 19" rack-mount design (taking just four rack spaces) allows the S8 and S6 to be easily integrated into any setup.

- Multiple channels (eight in the S8; six in the S6) and mic and line inputs for each channel allow you to blend together a variety of source signals, including dynamic or condenser microphones, keyboards, CD/tape players, etc. Standard XLR mic connectors (for microphone inputs) and electronically balanced 1/4" jacks (for line-level inputs) are provided for each channel; in addition, there is a dedicated CD/Tape input that provides dual phono (RCA) jacks.

- Power to spare—both units include a clean, high-quality amplifier, delivering 300 watts (in the case of the S8) or 210 watts (in the case of the S6) into four ohms. Any standard speaker cabinets (two, four, eight, or sixteen ohms) can be connected to the rear-panel 1/4" speaker output jacks.

- A built-in three-spring reverb unit allows you to add reverberation effects to your vocals or instruments without having to use an expensive external signal processor. A front-panel reverb master volume control allows you to precisely define the amount of reverb to be added to the signal.

- Each channel provides independent equalization controls (four-band in the S8, three-band in the S6), enabling you to shape the sound of your input signal sources. In addition, a ten-band graphic master equalizer allows you to "tune" the output of the S8/S6 to the particular room environment you are in. This can be particularly useful for eliminating ringing or feedback problems.

- In the S8, Peak LEDs for each channel show you at a glance when an input signal is on the verge of overloading. In the S6, a master Peak LED shows you at a glance when the internal amplifier is overloading. In both units, other front-panel LEDs show the current status of the amplifier's protection relay circuitry and whether or not phantom power is being applied.

- Independent input Trim controls for each channel that allows you to precisely set the correct input gain

- Two Effects sends per channel (one pre-fade and the other post-fade) allow you to route multiple signals to the internal reverb unit or to external signal processors. The pre-fade send (Effects send 1) can be used as a Monitor control, allowing you to set up an onstage monitor mix that is independent of the main house mix. A separate Monitor level control is provided on the front panel.

- In the S8, four Effects returns give you the ability to blend in the return signal from external signal processors or other line-level devices without having to utilize input channels. Two front-panel Effects return level controls (one for Effects returns 1-2 and the other for Effects returns 3-4) allow you to bring in stereo signals, which are then automatically mixed together in mono. In the S6, two Effects returns are provided, with a single front-panel control for the two.

S8/S6 Features

- A phantom power switch enables you to use the S8 and S6 with high-quality condenser microphones. When turned on, 48 volts of phantom power is provided to the mic connectors of all input channels.

- Protection relay circuitry prevents "thumps" when powering on or off This means that you can use the S8/S6 with a single power strip into which other audio devices are connected, without danger of damage to connected speakers.

- A rear-panel amplifier input allows you to bring external signals from other mixers or audio devices into the S8/S6 power amplifier

- A rear-panel preamplifier output allows you to connect the S8/S6 to external power amplifiers when higher power ratings are required and/or when additional amplifier feeds are necessary

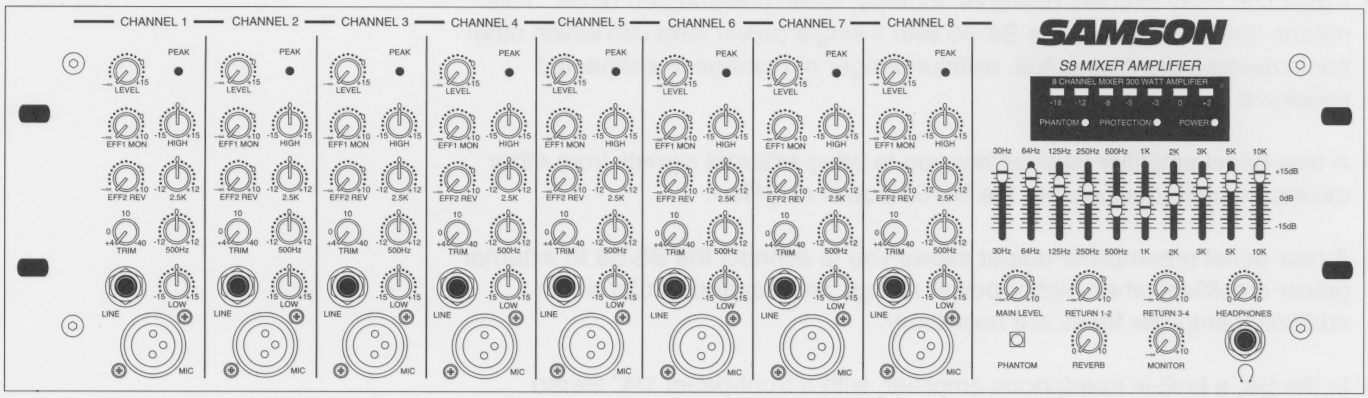
- In the S8, a built-in headphone amplifier, with a front-panel 1/4" stereo connector and dedicated level control allows you to monitor your main mix.

- In the S8, a convenient front-panel meter allows you to see at a glance the continuous output signal level.

We'll elaborate on many of these terms and features later in this manual Now it's time to take a guided tour of the units, starting with the S8.

Guided Tour - S8 Overview

The following illustration shows an overview of the front panel of the S8.



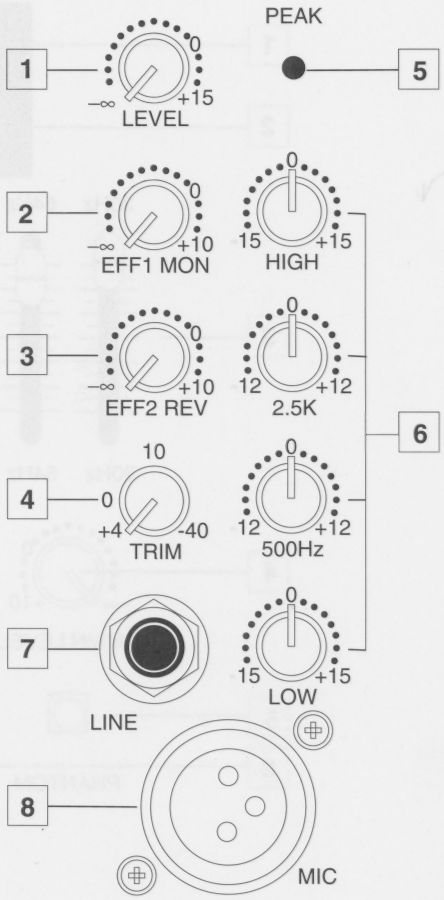
Channels

Main Section

1: Level (white) - This knob determines the final signal level being sent by a channel to the main speaker outputs as well as to Effect send 1 (see #2 below) In practice, this will be used to adjust the levels of the various signals being blended together by the S8. The "0" position indicates unity gain (no level attenuation or boost) Moving the knob counterclockwise from "0" (towards the "∞" position) causes the signal to be attenuated (when fully counterclockwise, the signal is attenuated infinitely—in other words, there is no sound) Moving it clockwise from the "0" position (towards the "+15" position) causes the signal to be boosted by as much as 15 db. For best signal-to-noise ratio, all channel level controls should be kept at or near the 0 level

2: Effect 1 / Monitor (gray) - This knob allows you to send signal from one or more channels to the S8's Monitor output or to an external signal processor connected to the Effect Send 1 output jack on the rear panel This effects send is *pre-fade*; that is, the level of the signal is determined solely by the channel's input trim, and is unaffected by its EQ settings and the position of its level control At the 0 position, the signal is routed with unity gain (that is, no boost or attenuation) As each Effect 1 / Monitor knob is turned clockwise from the 0 position, the signal is boosted; as it is turned counterclockwise from the 0 position, the signal is attenuated.

3: Effect 2 / Reverb (gray) - This knob allows you to send signal from one or more channels to the S8's internal reverb unit or to an external signal processor connected to the Effect Send 2 output jack on the rear panel This effects send is *post-fade*; that is, the level of the signal is determined by the channel's input trim, its EQ settings, and the position of its level control At the 0 position, the signal is routed with unity gain (that is, no boost or attenuation) As each Effect 2 / Reverb knob is turned clockwise from the 0 position, the signal is boosted; as it is turned counterclockwise from the 0 position, the signal is attenuated.



4: Input trim (black) - This knob determines the input level of the connected mic or line signal Continuously adjustable from +4 db to -40 db, the input trim is at unity gain (no boost or attenuation) when set to the "0" position The input signal is boosted when the trim is turned to the right of "0" and attenuated when turned to the left of "0."

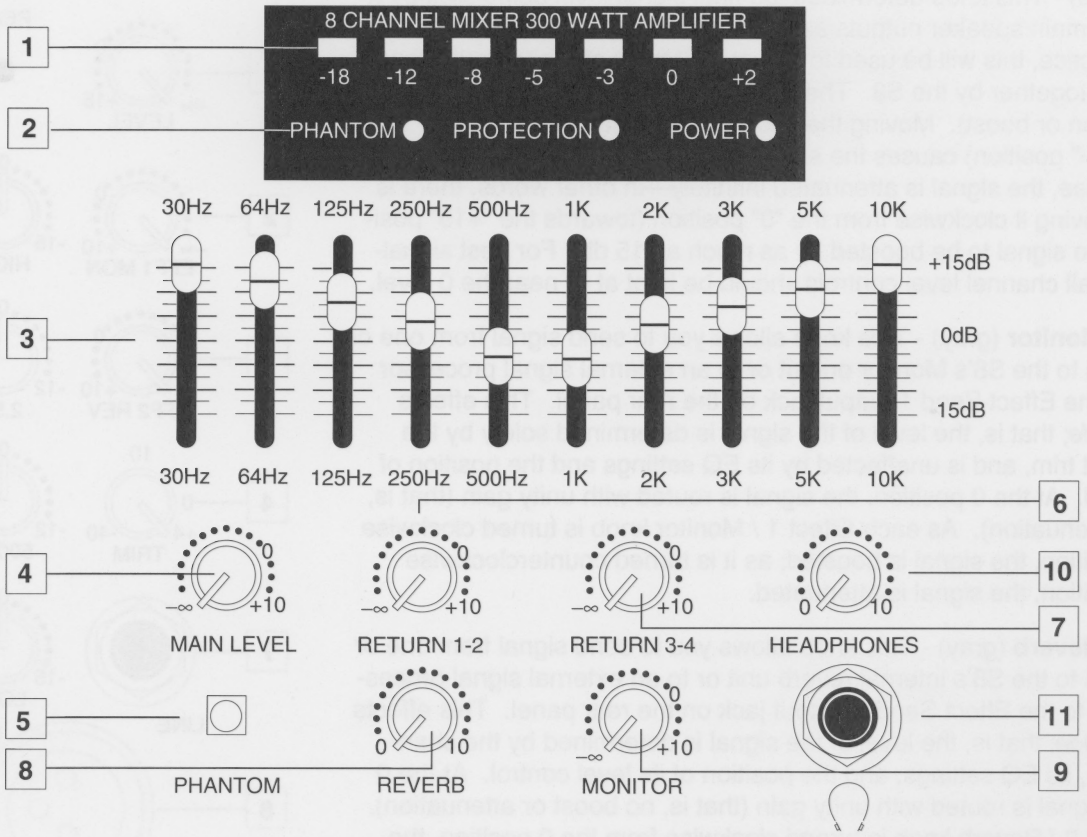
5: Peak LED (red) - This warning light indicates an overload situation It lights whenever a channel's signal is 5 db short of clipping. To stop it from lighting (and to eliminate the accompanying sonic distortion), turn down the channel's Input Trim knob (see #4 above) or reduce the amount of equalization boost.

6: Equalizer (blue) - These knobs determine the amount of boost or attenuation in each of four frequency areas. The high and low frequency knobs provide 15 db of cut or boost at 10 kHz and 80 Hz, respectively, with shelving-type control The high mid and low mid frequency knobs provide 12 db of cut or boost at 2.5 kHz and 500 Hz, respectively, with a bell (peaking) curve. A center detent in each knob (at the 12 o'clock position) indicates no boost or attenuation (that is, flat response) As each knob is turned clockwise from the center detent position, the frequency area is boosted; as it is turned counterclockwise from the center detent position, the frequency area is attenuated.

7: Line input connector - Connect line-level sources (such as synthesizers, drum machines, CD players, tape decks, or effects processors) to any of the S8's eight channels using this electronically balanced 1/4" jack (balanced or unbalanced signals can be accepted here) WARNING Do not connect a channel's line input if you already have something connected to its microphone input; each channel is designed to accept only one source or the other

8: Mic input connector - Connect a microphone to any of the S8's eight channels using this standard XLR jack. This jack is intended to accept signal from low-level, low-impedance mics but can also be used to accept signal from other sources (such as direct injection boxes) if the Input Trim control is turned down WARNING Do not turn the S8's Phantom power on if signal sources other than microphones are connected to any of these inputs. Also, do not connect a channel's microphone input if you already have something connected to its line input; each channel is designed to accept only one source or the other

Guided Tour - S8 Main Section



1: Meter - This seven-segment bar meter shows the continuous output level of the S8. For optimum signal-to-noise ratio, try to adjust all levels (channel and main) so that program material is usually at or around 0 VU, with occasional but not steady excursions to the +2 segment. See the "Setting Up and Using the S8/S6" section in this manual for more information

2: Meter LEDs - These show the status of various conditions within the S8. The leftmost LED (labeled "Phantom") lights steadily when Phantom power is being supplied to all mic inputs (see #5 below) The center LED (labeled "Protection") lights for approximately five seconds whenever the S8 is powered on and fades slowly when the unit is powered off It indicates the activity of the built-in protection relay circuitry during which time 0 volts DC are provided to all connected speakers, thus preventing any "thump." The rightmost LED (labeled "Power") lights steadily whenever the S8 is powered on.

3: Ten-Band Graphic Master EQ - These sliders allow you to add ±15 db of boost or attenuation to ten different frequency areas, affecting the main output signal of the S8. When a slider is at its center detented ("0 db") position, the selected frequency area is unaffected (it is said to be *flat*). When a slider is moved up (above the "0 db" position, towards the "+15 db" position), the selected frequency area is boosted, and when it is moved down (below the "0 db" position, towards the "-15 db" position), the selected frequency area is being attenuated. For more information, see the "Using Equalization" section in this manual

4: Main Level (white) - This knob determines the final signal level sent to the speaker output jacks on the rear panel At the fully counterclockwise ("∞") position, the signal is infinitely attenuated—that is, there is no sound. At the "0" position, the mixer is at unity gain and is providing no attenuation or boost to the

output signal. At the fully clockwise ("+10") position, approximately 10 db of gain is being added by the mixer to the output signal For more information, see the "Setting Up and Using the S8/S6" section in this manual

5: Phantom switch - When this switch is pressed in, the S8 delivers 48 volts of phantom power to pins 2 and 3 of all XLR microphone connectors in all eight channels. WARNING Only use this switch with the S8 powered down. Before turning phantom power on, be sure to disconnect all non-microphone signal sources (such as direct injection boxes) from the XLR mic jacks. Although phantom power will have no adverse affect on connected dynamic microphones, it should be used only when one or more condenser microphones are connected to the S8. **Refer to the owners manual of your microphone to determine whether or not it requires 48 volts phantom power—we cannot assume responsibility if you damage a mic by incorrectly applying S8 phantom power** If you're not completely certain that one or more connected mics require 48 volts phantom power, leave this switch off (its out position)

6: Return 1-2 Level (green) - This knob determines the input level of signal arriving via Effects returns 1 and 2 (mixed together in mono) This signal is at unity gain (no boost or attenuation) when the knob set to the 0 position and is boosted when the knob is turned to the right of 0 and attenuated when turned to the left of 0. For information on how to properly set this, see the sections in this manual entitled "Setting Up and Using the S8/S6" and "Using the Effects Sends and Returns."

7: Return 3-4 Level (green) - This knob determines the input level of signal arriving via Effects returns 3 and 4 (mixed together in mono) This signal is at unity gain (no boost or attenuation) when the knob set to the 0 position and is boosted when the knob is turned to the right of 0 and attenuated when turned to the left of 0. For information on how to properly set this, see the sections in this manual entitled "Setting Up and Using the S8/S6" and "Using the Effects Sends and Returns."

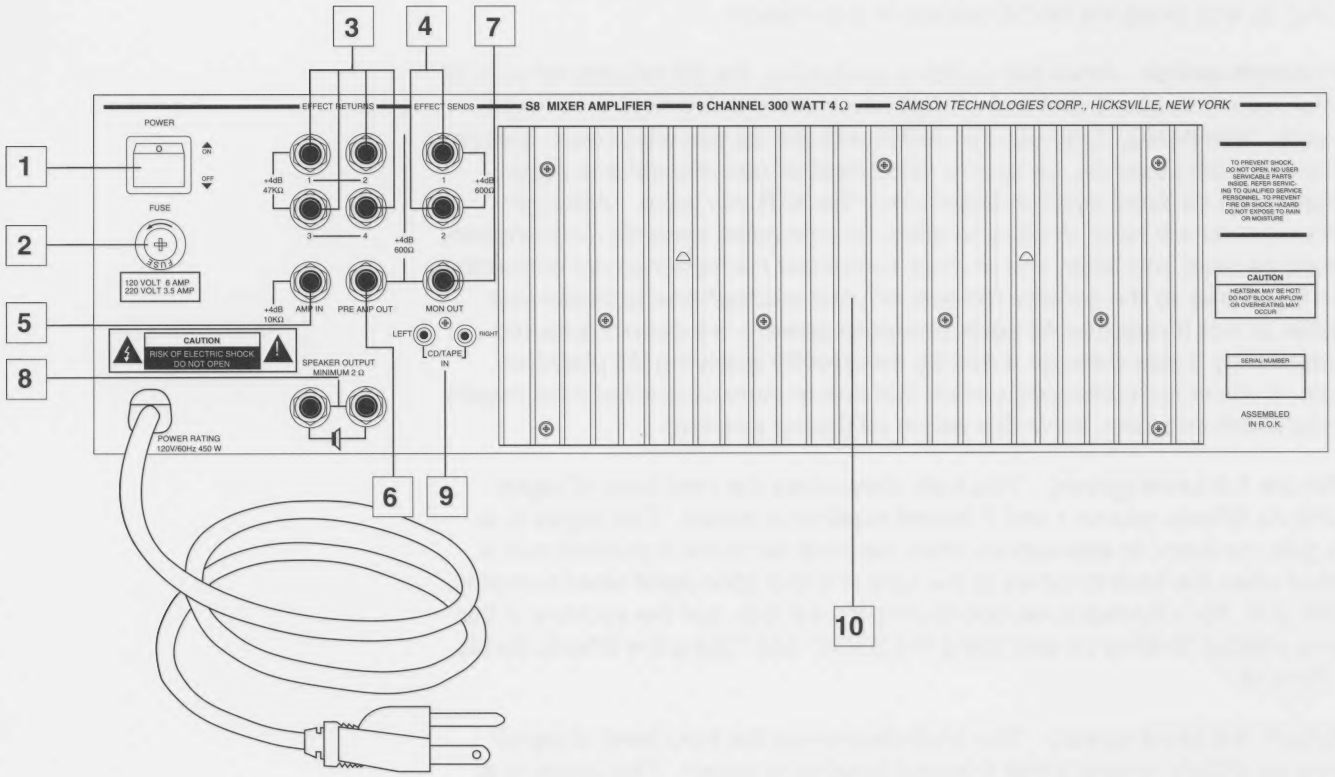
8: Reverb Level (green) - This knob determines the level of the return signal from the internal reverb unit. The amount of incoming reverb signal is increased as the knob is turned clockwise. For more information, see the "Using the Effects Sends and Returns" section in this manual

9: Monitor Level (green) - This knob determines the overall level of the signal being output from the rear panel Monitor jack. The amount of signal sent is increased as the knob is turned clockwise. For more information, see the "Using the Effects Sends and Returns" section in this manual.

10: Headphone Level (black) - This knob sets the level of the signal sent to the headphone jack. WARNING To avoid possible damage to connected headphones (or, worse yet, to your ears!), always turn this all the way off (to the fully counterclockwise "0" position) before plugging in a pair of headphones—then raise the level *slowly* while listening The Headphone Level has no effect on the final output level

11· Headphone jack - Connect any standard stereo headphones to this jack (via a standard 1/4" TRS plug) for private monitoring of the final output signal NOTE The S8 main speaker outputs are *not* muted when headphones are inserted into the Headphone jack—to monitor your main mix in privacy, it is necessary to set the Main Level control to its fully counterclockwise ("∞") position The built-in S8 headphone amplifier delivers 20 mW into 8 ohms.

Guided Tour - S8 Rear Panel



1: Power switch - As you may have guessed, this is what you use to turn the S8 on and off The built-in protection relay circuitry (which mutes the outputs for approximately five seconds after powering on) prevents power-on "thumping," which can potentially damage connected speakers.

2: Fuse holder - Insert a 6 amp fuse here for 120 volt operation. Insert a 3.5 amp fuse here for 220 volt operation.

3: Effect Returns - These unbalanced inputs allow you to route signal from external devices such as effects processors to the Effects Return section of the S8. Stereo devices should be connected to the matched pairs 1-2 and 3-4, mono devices should be connected to one input in each pair (that is, 1 and 3 or 2 and 4) Because the S8 is a monophonic system, stereo signals routed to either pair of Effects returns are automatically mixed to mono. See the "Using the Effects Sends and Returns" section in this manual for more information.

4: Effects Sends - These unbalanced outputs allow you to route signal from each of the two discrete Effects Sends to external devices such as effects processors. Effects Send 1 is pre-fader and pre-EQ, while Effects Send 2 is post-fader and post-EQ See the "Using the Effects Sends and Returns" section in this manual for more information.

5: Amp In - This unbalanced input allows you to connect any external monophonic line-level signal directly to the S8 power amplifier This input is *not* affected by either the ten-band graphic master equalizer or the S8's Main Level control. The Amp In jack can optionally also be used as an insert patch point as follows.

- Ring - A preamp output which *is* affected by both the ten-band graphic master equalizer and the S8's Main Level control
- Tip - An amp input which is *not* affected by either the ten-band graphic master equalizer or the S8's Main Level control

For more information about the use of the Amp In jack as an insert patch point, contact Samson Technical Support (516-932-1062) between 9 AM and 5 PM EST

6: Preamp Out - This unbalanced output provides a monophonic line-level output from the S8 mixer section; it is normally used to connect the unit to an external power amplifier and speakers where additional power is required or where additional amplifier feeds are necessary This output is *not* affected by either the ten-band graphic master equalizer or the S8's Main Level control

7: Monitor Out - This unbalanced output provides a monophonic line-level output from Effects Send 1, post-Monitor level control (but unaffected by the Main Level control) It is normally used to connect the unit to an external monitor mixer/amplifier/speaker system so that the performers can receive an onstage monitor mix independent of the house mix. See the "Using the Effects Sends and Returns" section of this manual for more information

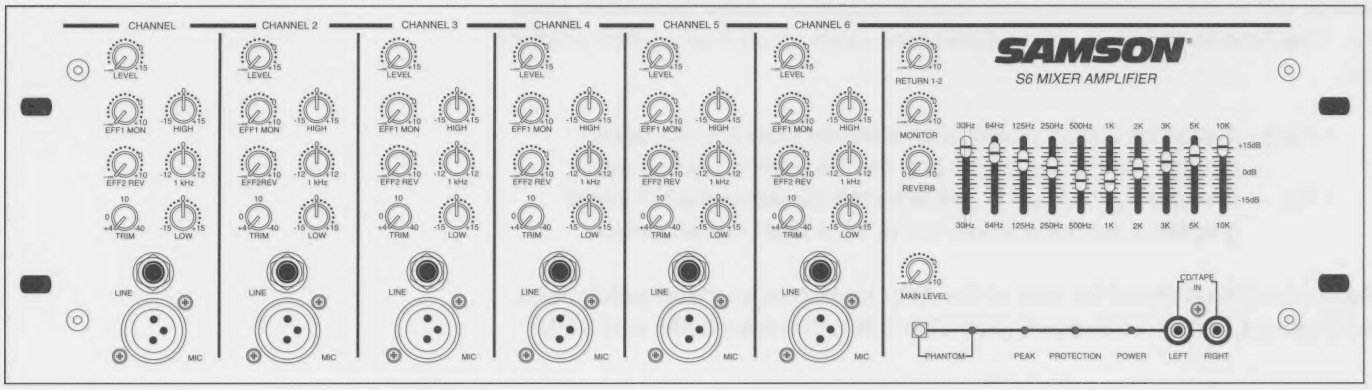
8: Speaker Output - These are the S8's main outputs; use these unbalanced jacks to connect the S8 to any speakers rated at 4 ohms or greater (that is, 4, 8, or 16 ohms) The lower the ohm rating, the greater the power output. We recommend the use of 4 ohm speakers for long-term usage. The S8 delivers 300 watts of power into 4 ohms at less than 1% THD (Total Harmonic Distortion) In order to ensure correct phase correlation, the tip of the S8 speaker jack should be connected to the "+" (hot) input of your loudspeaker, and the sleeve of the S8 speaker jack should be connected to the "-" (ground) input of your loudspeaker

9: CD/Tape In - Use these dual RCA input jacks to connect the output from a CD or tape player to the S8. When connected, the signal is mixed to mono and appears at Channel 8, at unity gain (the Trim control has no effect) From there, it can be equalized if necessary and routed to either of the two Effects sends (for routing to connected external processors, to the internal reverb unit, and/or to the Monitor output)

10: Heat sink - Make sure this anodized aluminum heat sink is unobstructed when the S8 is powered on In particular, we recommend that you keep the rear of the rack open in order to release heat. If your rack does not have a removable rear, space should be left open on the front of the rack cabinet, especially immediately above the S8—remember, heat rises!

Guided Tour - S6 Overview

The following illustration shows an overview of the front panel of the S6:



Channels

Main Section

1: Level (white) - This knob determines the final signal level being sent by a channel to the main speaker outputs as well as to Effect send 1 (see #2 below) In practice, this will be used to adjust the levels of the various signals being blended together by the S6. The "0" position indicates unity gain (no level attenuation or boost) Moving the knob counterclockwise from "0" (towards the "∞" position) causes the signal to be attenuated (when fully counterclockwise, the signal is attenuated infinitely—in other words, there is no sound). Moving it clockwise from the "0" position (towards the "+15" position) causes the signal to be boosted by as much as 15 db. For best signal-to-noise ratio, all channel level controls should be kept at or near the 0 level

2: Effect 1 / Monitor (gray) - This knob allows you to send signal from one or more channels to the S6's Monitor output or to an external signal processor connected to the Effect Send 1 output jack on the rear panel. This effects send is *pre-fade*; that is, the level of the signal is determined solely by the channel's input trim, and is unaffected by its EQ settings and the position of its level control. At the 0 position, the signal is routed with unity gain (that is, no boost or attenuation) As each Effect 1 / Monitor knob is turned clockwise from the 0 position, the signal is boosted; as it is turned counterclockwise from the 0 position, the signal is attenuated.

3: Effect 2 / Reverb (gray) - This knob allows you to send signal from one or more channels to the S6's internal reverb unit or to an external signal processor connected to the Effect Send 2 output jack on the rear panel. This effects send is *post-fade*; that is, the level of the signal is determined by the channel's input trim, its EQ settings, and the position of its level control. At the 0 position, the signal is routed with unity gain (that is, no boost or attenuation) As each Effect 2 / Reverb knob is turned clockwise from the 0 position, the signal is boosted; as it is turned counterclockwise from the 0 position, the signal is attenuated.

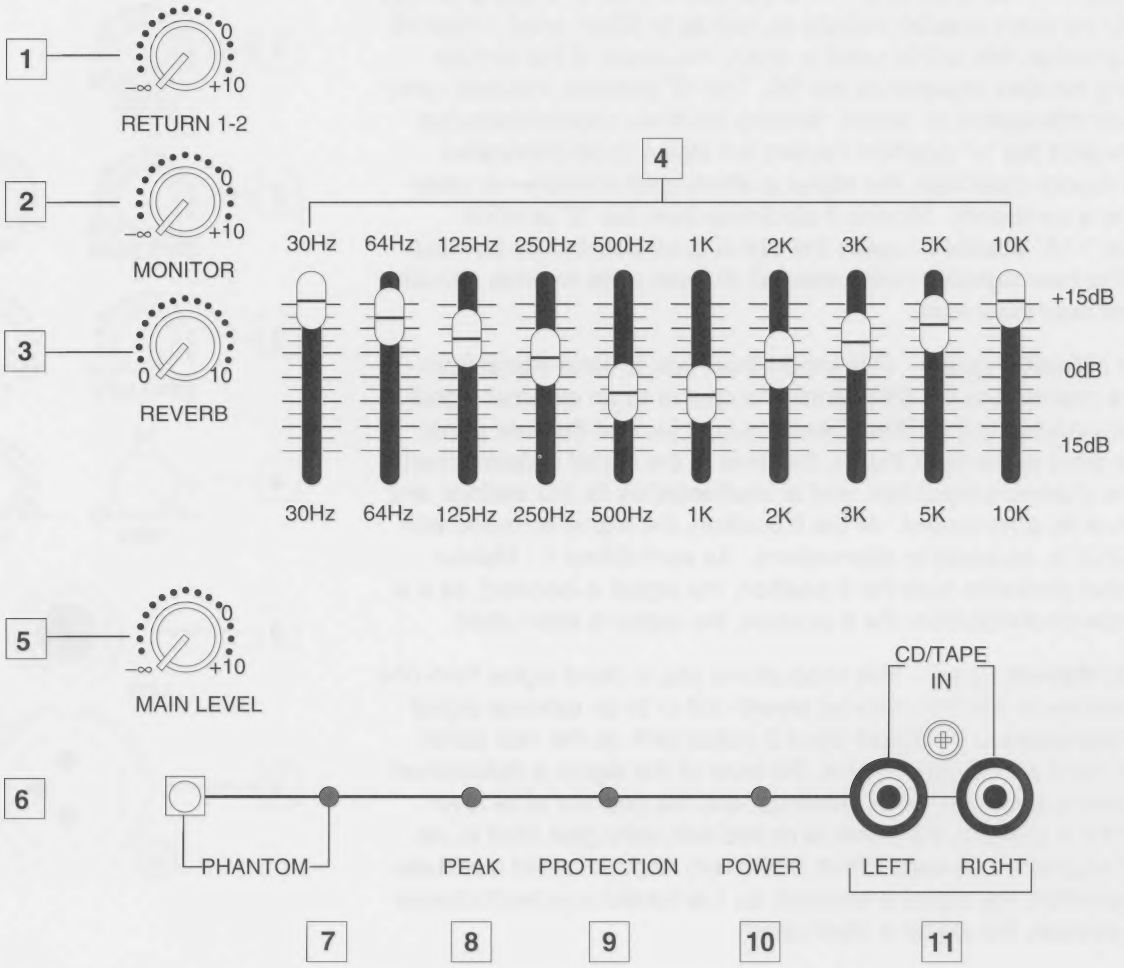
4: Input trim (black) - This knob determines the input level of the connected mic or line signal Continuously adjustable from +4 db to -40 db, the input trim is at unity gain (no boost or cut) when set to the "0" position The input signal is boosted when the trim is turned to the right of "0" and attenuated when turned to the left of "0."

5: Equalizer (blue) - These knobs determine the amount of boost or attenuation in each of three frequency areas. The high and low frequency knobs provide 15 db of cut or boost at 10 kHz and 80 Hz, respectively, with shelving-type control. The middle frequency knobs provide 12 db of cut or boost at 1 kHz, with a bell (peaking) curve. A center detent in each knob (at the 12 o'clock position) indicates no boost or attenuation (that is, flat response) As each knob is turned clockwise from the center detent position, the frequency area is boosted; as it is turned counterclockwise from the center detent position, the frequency area is attenuated.

6: Line input connector - Connect line-level sources (such as synthesizers, drum machines, CD players, tape decks, or effects processors) to any of the S6's six channels using this electronically balanced 1/4" jack (balanced or unbalanced signals can be accepted here). WARNING Do not connect a channel's line input if you already have something connected to its microphone input; each channel is designed to accept only one source or the other

7: Mic input connector - Connect a microphone to any of the S6's six channels using this standard XLR jack. This jack is intended to accept signal from low-level, low-impedance mics but can also be used to accept signal from other sources (such as direct injection boxes) if the Input Trim control is turned down WARNING. Do not turn the S6's Phantom power on if signal sources other than microphones are connected to any of these inputs. Also, do not connect a channel's microphone input if you already have something connected to its line input; each channel is designed to accept only one source or the other

Guided Tour - S6 Main Section



1: Return 1-2 Level (green) - This knob determines the input level of signal arriving via Effects returns 1 and 2 (mixed together in mono) This signal is at unity gain (no boost or attenuation) when the knob set to the 0 position and is boosted when the knob is turned to the right of 0 and attenuated when turned to the left of 0. For information on how to properly set this, see the sections in this manual entitled "Setting Up and Using the S8/S6" and "Using the Effects Sends and Returns."

2: Monitor Level (green) - This knob determines the overall level of the signal being output from the rear panel Monitor jack. The amount of signal sent is increased as the knob is turned clockwise. For more information, see the "Using the Effects Sends and Returns" section in this manual.

3: Reverb Level (green) - This knob determines the level of the return signal from the internal reverb unit. The amount of incoming reverb signal is increased as the knob is turned clockwise. For more information, see the "Using the Effects Sends and Returns" section in this manual.

4: Ten-Band Graphic Master EQ - These sliders allow you to add ±15 db of boost or attenuation to ten different frequency areas, affecting the main output signal of the S6. When a slider is at its center detented ("0 db") position, the selected frequency area is unaffected (it is said to be *flat*) When a slider is moved up (above the "0 db" position, towards the "+15 db" position), the selected frequency area is boosted, and when it is moved down (below the "0 db" position, towards the "-15 db" position), the selected frequency area is being attenuated. For more information, see the "Using Equalization" section in this manual

5: Main Level (white) - This knob determines the final signal level sent to the speaker output jacks on the rear panel. At the fully counterclockwise ("∞") position, the signal is infinitely attenuated—that is, there is no sound. At the "0" position, the mixer is at unity gain and is providing no attenuation or boost to the output signal. At the fully clockwise ("+10") position, approximately 10 db of gain is being added by the mixer to the output signal. For more information, see the "Setting Up and Using the S8/S6" section in this manual.

6: Phantom switch - When this switch is pressed in, the S6 delivers 48 volts of phantom power to pins 2 and 3 of all XLR microphone connectors in all six channels. WARNING Only use this switch with the S6 powered down. Before turning phantom power on, be sure to disconnect all non-microphone signal sources (such as direct injection boxes) from the XLR mic jacks. Although phantom power will have no adverse affect on connected dynamic microphones, it should be used only when one or more condenser microphones are connected to the S6. **Refer to the owners manual of your microphone to determine whether or not it requires 48 volts phantom power—we cannot assume responsibility if you damage a mic by incorrectly applying S6 phantom power.** If you're not completely certain that one or more connected mics require 48 volts phantom power, leave this switch off (its out position)

7: Phantom LED - This lights steadily when Phantom power is being supplied to all mic inputs (see #6 above)

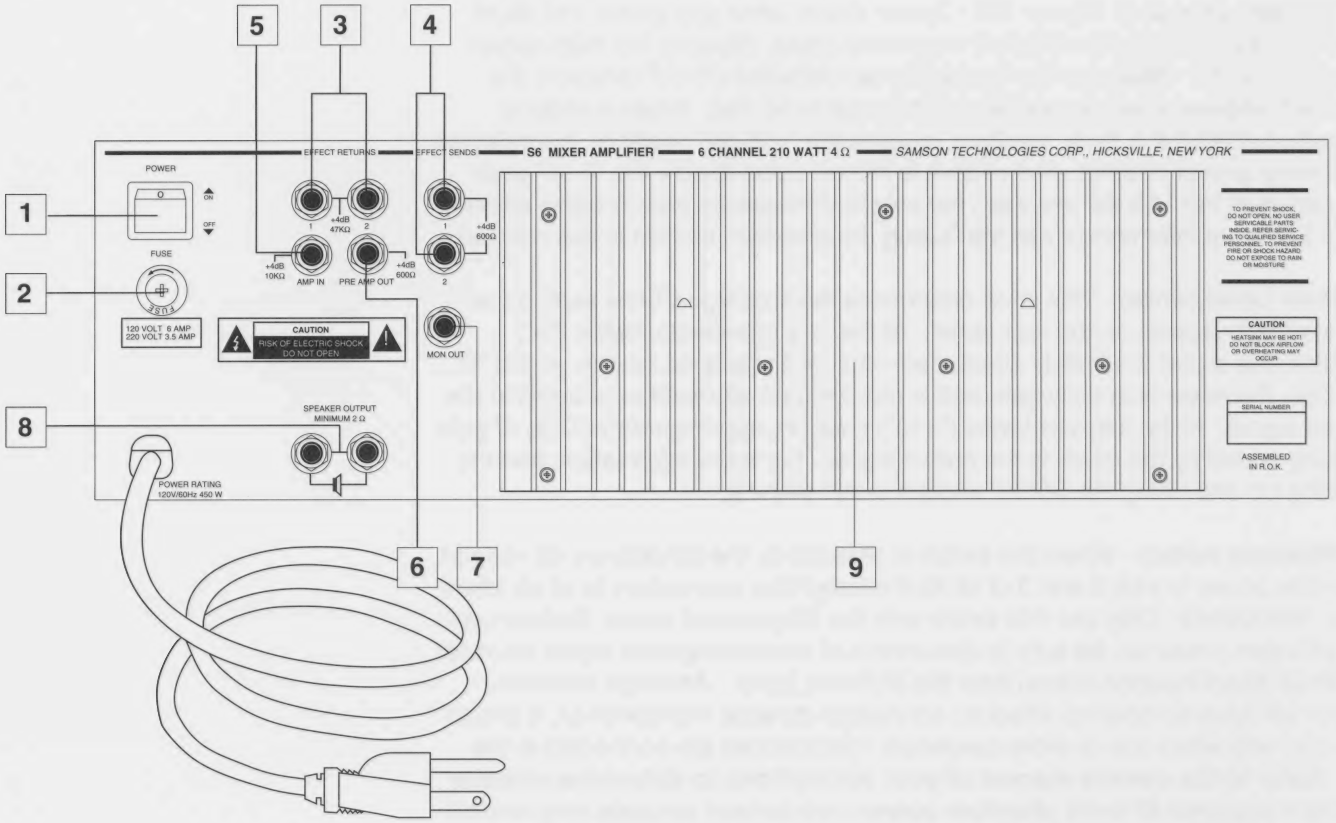
8: Peak LED - This warning light indicates an overload situation in the S6 amplifier To stop it from lighting (and to eliminate the accompanying sonic distortion), turn down one or more channel's Input Trim knob or reduce the amount of equalization boost in the offending channel(s). See the "Setting Up and Using the S8/S6" and "Using Equalization" sections in this manual for more information.

9: Protection LED - This lights for approximately five seconds whenever the S6 is powered on and fades slowly when the unit is powered off It indicates the activity of the built-in protection relay circuitry during which time 0 volts DC are provided to all connected speakers, thus preventing any "thump."

10: Power LED - This lights steadily whenever the S6 is powered on

11: CD/Tape In - Use these dual RCA input jacks to connect the output from a CD or tape player to the S6. When connected, the signal is mixed to mono and appears at Channel 6, at unity gain (the Trim control has no effect) From there, it can be equalized if necessary and routed to either of the two Effects sends (for routing to connected external processors, to the internal reverb unit, and/or to the Monitor output)

Guided Tour - S6 Rear Panel



1: Power switch - As you may have guessed, this is what you use to turn the S6 on and off The built-in protection relay circuitry (which mutes the outputs for approximately five seconds after powering on) prevents power-on "thumping," which can potentially damage connected speakers.

2: Fuse holder - Insert a 6 amp fuse here for 120 volt operation. Insert a 3.5 amp fuse here for 220 volt operation

3: Effect Returns - These unbalanced inputs allow you to route signal from external devices such as effects processors to the Effects Return section of the S6. Because the S6 is a monophonic system, stereo signals input to the pair of Effects returns 1-2 are automatically mixed to mono. See the "Using the Effects Sends and Returns" section in this manual for more information

4: Effects Sends - These unbalanced outputs allow you to route signal from each of the two discrete Effects Sends to external devices such as effects processors. Effects Send 1 is pre-fader and pre-EQ, while Effects Send 2 is post-fader and post-EQ. See the "Using the Effects Sends and Returns" section in this manual for more information

5: Amp In - This unbalanced input allows you to connect any external monophonic line-level signal directly to the S6 power amplifier This input is *not* affected by either the ten-band graphic master equalizer or the S6's Main Level control. The Amp In jack can optionally also be used as an insert patch point as follows:

- Ring - A preamp output which *is* affected by both the ten-band graphic master equalizer and the S6's Main Level control.
- Tip - An amp input which is *not* affected by either the ten-band graphic master equalizer or the S6's Main Level control.

For more information about the use of the Amp In jack as an insert patch point, contact Samson Technical Support (516-932-1062) between 9 AM and 5 PM EST

6: Preamp Out - This unbalanced output provides a monophonic line-level output from the S6 mixer section; it is normally used to connect the unit to an external power amplifier and speakers where additional power is required or where additional amplifier feeds are necessary This output is *not* affected by either the ten-band graphic master equalizer or the S6's Main Level control

7: Monitor Out - This unbalanced output provides a monophonic line-level output from Effects Send 1, post-Monitor level control (but unaffected by the Main Level control) It is normally used to connect the unit to an external monitor mixer/amplifier/speaker system so that the performers can receive an onstage monitor mix independent of the house mix. See the "Suggested Setups" section of this manual for more information

8: Speaker Output - These are the S6's main outputs, use these unbalanced jacks to connect the S6 to any speakers rated at 4 ohms or greater (that is, 4, 8, or 16 ohms) The lower the ohm rating, the greater the power output. We recommend the use of 4 ohm speakers for long-term usage. The S6 delivers 210 watts of power into 4 ohms at less than 1% THD (Total Harmonic Distortion) In order to ensure correct phase correlation, the tip of the S6 speaker jack should be connected to the "+" (hot) input of your loudspeaker, and the sleeve of the S6 speaker jack should be connected to the "-" (ground) input of your loudspeaker

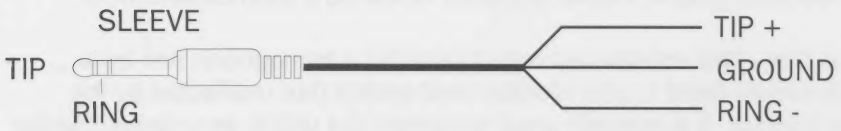
9: Heat sink - Make sure this anodized aluminum heat sink is unobstructed when the S6 is powered on In particular, we recommend that you keep the rear of the rack open in order to release heat. If your rack does not have a removable rear, space should be left open on the front of the rack cabinet, especially immediately above the S6—remember, heat rises!

Connecting The S8/S6 - General Suggestions

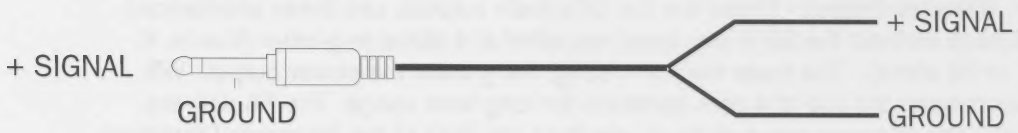
The actual connections you'll make to and from the S8/S6 will vary according to the environment you use it in and the particular equipment you have. However, here are a few basic rules concerning connections that will apply in pretty much all situations:

- In general, it's best to make all connections with the S8/S6 turned off—this particularly applies to speaker connections. If you must make connections with the power on, make sure that the Main Level control is completely down (turn the knob fully counterclockwise). Before powering down, turn the Main Level control completely down.

- When using line inputs, try to use balanced connectors and cabling wherever possible. These kind of connections do a better job of rejecting extraneous noise and hum and generally provide a cleaner signal If your equipment doesn't provide balanced outputs, however, not to worry· All S8/S6 channel line inputs will accept either balanced or unbalanced connectors. The diagram below shows how balanced 1/4" TRS (Tip/Ring/Sleeve) connectors should be wired:

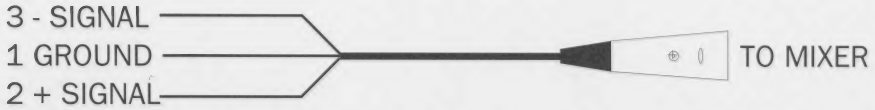


Unbalanced cables use standard 1/4" phone connectors, wired as follows.



- Make one connection at a time and then monitor the incoming signal. If you hear a distinct hum or buzz, you may have a grounding problem with that particular device See the section in this manual entitled "Grounding Techniques" for information on how to avoid grounding problems.

- NEVER connect a microphone and line level input to the same channel simultaneously—use one or the other You can have some channels connected to microphones and others to line level signals (for example, you might want to plug mics into channels 1 - 4 and line level signals into the remaining channels)—just don't have both kinds of inputs connected to the *same* channel. The diagram below shows how your mic connectors should be wired:



Setting up your S8/S6 is a simple procedure which takes only a few minutes:

1 Remove all packing materials (save them in case of need for future service) and decide where the unit is to be physically placed—it can be mounted in any standard 19" rack, requiring four rack spaces. Be careful when handling the S8/S6—the rear heat sink fins and side rack panels have sharp edges. Make sure that the rear heat sink fins are unobstructed and that there is good ventilation around the entire unit. If your rack contains multiple amplifiers, we recommend that you avoid potential overheating problems by using spacer panels to ensure that the amps are not directly on top of one another

2. Before even plugging the unit into an AC socket, begin by making the speaker connections. It is never a good idea to power up any amplifier that is not connected to loudspeakers. Any loudspeakers with a minimum impedance load of 2 ohms (that is, 2 ohms or greater) can be used. However, we recommend the use of 4 ohm speakers for long-term usage. In order to ensure correct phase correlation, be sure that the connection from the tip of the S8/S6 speaker jack goes to the "+" (hot) input of your loudspeaker, and that the sleeve of the S8/S6 speaker jack is connected to the "-" (ground) input of your loudspeaker

3. Next, make the signal input connections to the mic or line inputs of the various channels. WARNING. Do not connect a channel's line input if you already have something connected to its microphone input, or vice versa, each channel is designed to accept only one source or the other

4. Turn all channel Trim and Level controls as well as the Main Level control fully counterclockwise, to their "∞" setting. Then plug the unit into any grounded AC socket. Because of the special relay protection circuitry built into the S8/S6, you can even plug it into the same power strip that other audio devices (such as a mixing console) are connected to. You can then turn on all devices at once with the single power strip on-off switch, with no danger of damaging connected speakers by generating "thumps."

5. Press the rear panel Power switch in order to turn on the unit. The Protection LED will go on for approximately five seconds, and then switch off (you'll hear a click when it does)

Setting the Correct Gain Structure

You're now ready to establish the correct gain structure—the key to getting the best performance from the S8/S6, or from any mixer, for that matter This is a simple procedure that ensures optimum input and output levels so that no unnecessary noise (caused by too low a signal) or overload distortion (caused by too high a signal) is created. Here's a step-by-step description of how to do so:

a. With all connections made (as described above) but with *the power off*, start by setting all channel level controls fully counterclockwise (to their "∞" position), and then set the Main Level knob to its "0" position

b. Set all channel input trim knobs to their fully counterclockwise (+4) position.

c. Set all channel equalizer knobs to their center detent "0" positions and set the ten-band graphic master equalizer completely flat (all sliders at their center detent "0" positions).

d. Set all channel Effects send knobs and all Effects return level knobs to their fully counterclockwise ("∞") position

e. Turn on all devices connected to channel line inputs and Effects returns and set their level controls to unity gain or, if there is no unity gain indicated on their output control, to maximum. If you've got outboard effects processors connected to Effects returns, make sure they are sending completely "wet" (processed) signal, with no "dry" (unprocessed) signal mixed in

f If any condenser microphones are connected to the S8/S6, turn on the Phantom switch * Then turn on the S8/S6's main power

g. Play an instrument connected to one of the S8/S6's line inputs** and, while doing so, raise the corresponding channel level control to the "0" position. If you are using an S8, you should see the segment meter begin to move—adjust the input trim control for that channel so that the "0" segment lights frequently and the "+2" segment lights only occasionally If you are using an S6, adjust the input trim control for that channel until the Peak LED just begins flashing and then back off just to the point at which it does not flash at even the highest level input signals. In both the S8 and S6, if the incoming signal seems too hot even with the input channel trim all the way at its minimum (+4) setting, you may need to lower the output level of the instrument, though this will rarely occur Conversely, if the signal is too low even with the input channel trim all the way up, something's definitely wrong: in all likelihood, the connecting audio cable is faulty

h. Once you've set the optimum level in step (g) above, continue playing the instrument and slowly raise the main level knob until you get the level you want to hear

** CAUTION: Before turning phantom power on, be sure to verify that the connected mic(s) require 48 volts. Also, disconnect all non-microphone signal sources (such as direct injection boxes) from the XLR mic jacks.*

*** If you're using an instrument such as electric guitar or bass, we recommend that you connect it to the S8/S6 with a direct injection box to ensure correct impedance.*

i. Repeat step (g) above for each instrument connected to the S8/S6 channel line inputs.

j. The procedure for setting optimum microphone levels is virtually identical, sing or speak into the mic at the level you expect to use in performance while slowly raising the level control for that channel to its "0" position. Then adjust the input trim control for that channel while watching the meter (if you're using an S8) or Peak LED (if you're using an S6) You should expect that microphone inputs will require rather more in the way of input trim boost than line inputs.

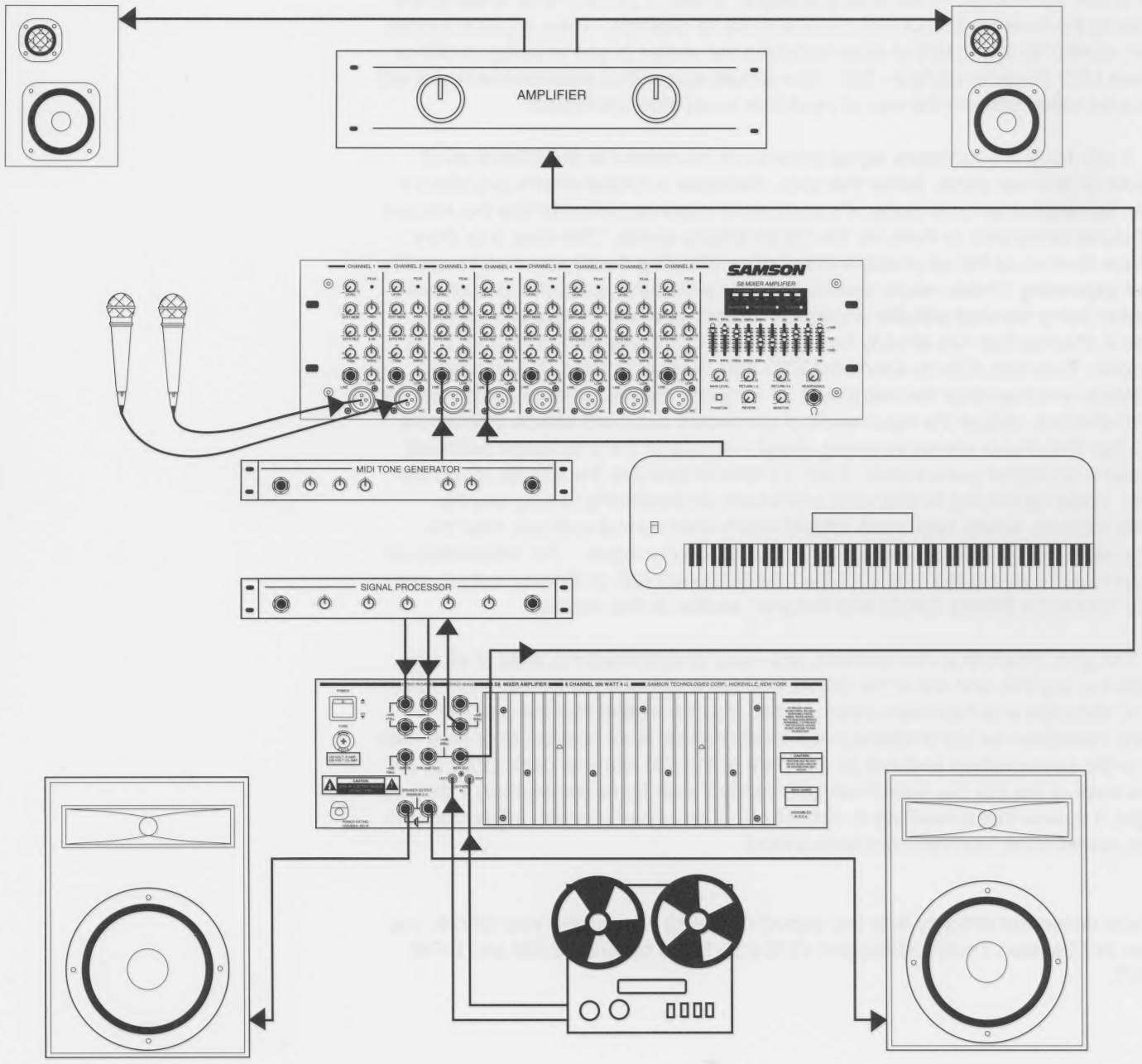
k. If you have any outboard signal processors connected to the Effects send jacks on the rear panel, follow this step. Because outboard effects processors can sometimes be quite noisy, it's particularly important to maximize the amount of signal being sent to them via the S8/S6 Effects sends. The idea is to drive these devices as hot as possible (short of overloading them) and then to use the corresponding Effects return level to carefully adjust the amount of processed signal being blended with the dry signal. To set optimum Effects send levels, use a channel that has already had its gain structure adjusted in step (g) or (j) above. Turn both Effects send knobs for that channel to their "0" (unity gain) position and then play the instrument (or sing into the microphone) connected to that channel Adjust the input levels of connected outboard effects processors so that their meter shows incoming signal normally in the 0 vu range (with just occasional higher excursions) Then it's time to optimize the Effects return levels. While continuing to play your instrument (or continuing to sing into the microphone), slowly raise each Effects return level control until you hear the desired amount of processed signal added to the dry signal For information on how to correctly set the levels for the internal reverb unit or Monitor output, see the "Using the Effects Sends and Returns" section in this manual.

l. The gain structure is now correctly set—you've optimized the level of all signals coming into and out of the S8/S6, and the end result will be minimum noise and distortion and maximum clean sound. You'll now find that the majority of your mixes can be accomplished with most channel level controls at or near their 0 (unity gain) position and that (in the case of the S8) channel peak LEDs or (in the case of the S6) the main Peak LED rarely if ever lights (remember, if they do light, it means that something is distorting!) If you need to make adjustments to the overall level, use the main level control.

If you encounter difficulty with any aspect of setting up or using your S8/S6, you can call Samson Technical Support (516-932-1062) between 9 AM and 5 PM EST

Suggested Performance Application - S8

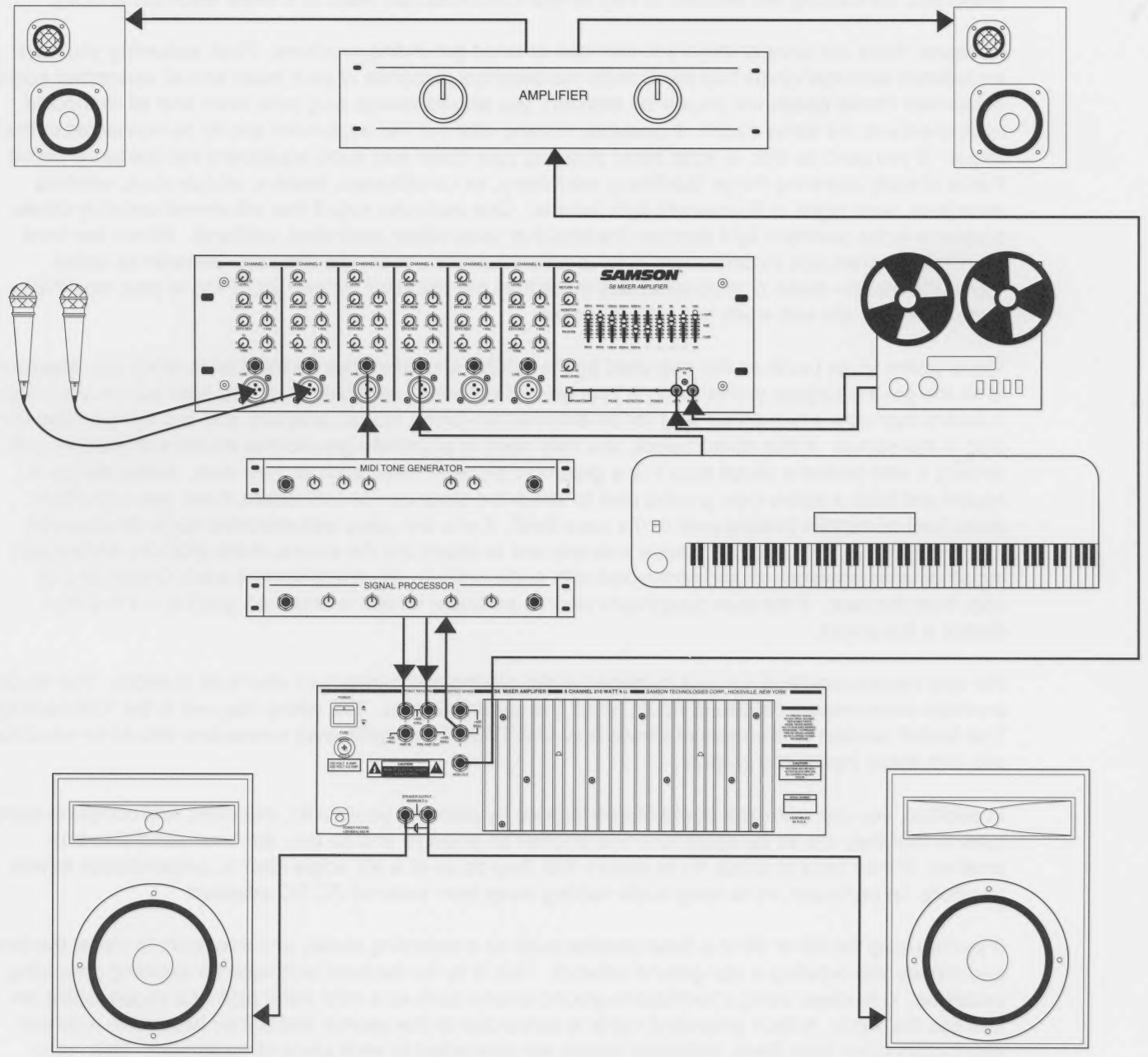
The following illustration shows the basic interconnections between an S8 and external equipment when used in a typical live performance application:



The main connections here involve connecting the S8 speaker outputs to PA speakers and the Monitor output to the input of an external amplifier driving onstage monitors. Various microphones and line level signals are connected to channel mic and line inputs and a tape player is connected to the CD/Tape input. A signal processor is connected to Effects Send 2, with the resulting processed signal returned to Effects Returns 1 and 2.

Suggested Performance Application - S6

The following illustration shows the basic interconnections between an S6 and external equipment when used in a typical live performance application:



The main connections here involve connecting the S6 speaker outputs to PA speakers and the Monitor output to the input of an external amplifier driving onstage monitors. Various microphones and line level signals are connected to channel mic and line inputs and a tape player is connected to the CD/Tape input. A signal processor is connected to Effects Send 2, with the resulting processed signal returned to Effects Returns 1 and 2.

Grounding Techniques

Hum and buzz are the biggest enemies you face when interconnecting a large number of different pieces of equipment to a central audio mixer This is because each piece of equipment may operate at a marginally different voltage (this difference is called *potential*) and, when two devices at slightly different potential are physically connected with audio cabling, the end result can be nasty, extraneous noise (mind you, connecting two devices at *very* different potential can result in a major electrical shock!)

However, there are several steps you can take to avoid grounding problems. First, assuming you have an isolated electrical circuit that can handle the electrical demands of your mixer and all connected audio equipment (these needs will usually be modest), you should always plug your mixer and all connected equipment into the same circuit. If possible, nothing else but this equipment should be connected to that circuit. If you can't do this, at least avoid plugging your mixer and audio equipment into the same circuit that is already powering things like heavy machinery, air conditioners, heaters, refrigerators, washing machines, neon signs or fluorescent light fixtures. One particular culprit that will almost certainly create problems is the standard light dimmer (the kind that uses silicon controlled rectifiers) Where low-level lighting is desired, use incandescent fixtures with autotransformer-type dimmers (sometimes called *Variacs*) instead—these cost considerably more than the standard dimmer you'll find at your local hardware store, but are well worth the extra expense.

Three-prong plugs (such as the one used by the S8/S6) should always be used as is; don't use adapters to lift the ground (unless you're using a "star ground network"—see below) If you hear hum or buzz from a device that uses a two-prong plug (or an external two-prong AC/DC adapter), you can try reversing the plug in the socket. If that doesn't work, you may need to physically ground that device's chassis by connecting a wire (called a *strap*) from it to a grounded piece of metal such as rack ears. Some pieces of equipment have a screw-type ground post to which the strap can be connected; if not, you can attach some kind of metallic binding post to the case itself If you are using rack-mounted audio devices and are experiencing hum or buzz, there's a simple test to determine the source of the problem. while keeping all devices powered on and connected with audio cabling, physically remove each device, one by one, from the rack. If the hum disappears when a particular device is removed, you'll know that that device is the culprit.

We also recommend that you use balanced audio cabling and connectors wherever possible. The S8/S6 provides electronically balanced inputs for all line channel inputs. The wiring diagram in the "Connecting The S8/S6" section of this manual shows how 1/4" TRS (Tip/Ring/Sleeve) connectors should be wired for use with these inputs and outputs.

In addition, you can minimize possible interference by planning your audio, electrical, and computer cable runs so that they are as far apart from one another as possible and so they don't run parallel to one another If they have to cross, try to ensure that they do so at a 90° angle (that is, perpendicular to one another) In particular, try to keep audio cabling away from external AC/DC adapters

If you're using the S8 or S6 in a fixed location such as a recording studio, you may want to invest the time and money into creating a *star ground network*. This is by far the best technique for avoiding grounding problems. It involves using a formidable ground source such as a cold water pipe or a copper spike driven into the earth A thick grounding cable is connected to that source and is then brought to a central distribution point; from there, individual cables are connected to each piece of equipment. This setup also requires that you lift the ground plug of all three-prong AC connectors, so there is the possibility of danger if it is done incorrectly We strongly recommend that you contract with a qualified professional to carry out this or any kind of electrical work.

Another, less common problem you may encounter is that of *oscillation* (a ringing tone), which, apart from being annoying, is potentially dangerous to your speakers. This is generally caused either by poor outside wiring or by returning a signal out of phase (most commonly from an outboard signal processor) If audible oscillation occurs, try isolating each input signal by turning down all other inputs. If one signal alone is causing the problem, you should be able to eliminate the oscillation by reversing that signal's phase (many signal processors have a switch that allows you to do this)

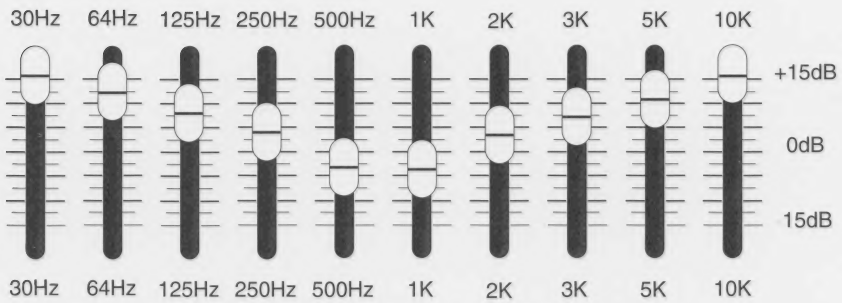
One of the most exciting aspects to using a mixer such as the S8 or S6 is having the ability to shape a sound, using a process called *equalization*. But there are few areas of sound engineering more misunderstood than equalization, and, just as good EQ can really help a sound, bad EQ can really hurt it, so read on.

Every naturally occurring sound consists of a broad range of pitches, or *frequencies*, combined together in a unique way This blend is what gives every sound its distinctive tonal color The EQ section in a mixer allows you to alter a sound by boosting or attenuating specific frequency areas. Both the S8 and S6 provide a ten-band graphic master equalizer (more about this shortly) as well as independent equalization for each channel. The S8 offers four-band equalization controls for each of the eight input channels. The center frequency areas are, from high to low· 10 kHz, 2.5 kHz, 500 Hz, and 80 Hz. Each EQ knob is labeled with the maximum amount of cut or boost provided (± 15 db in the case of the highest and lowest frequencies and ± 12 db in the case of the two mid frequencies). The S6 provides three-band equalization controls for each of the six input channels. The center frequency areas are, from high to low· 10 kHz, 1 kHz, and 80 Hz. Again, each EQ knob is labeled with the maximum amount of cut or boost provided (± 15 db in the case of the highest and lowest frequencies and ± 12 db in the case of the middle frequency).

S8 EQ section

We provided these particular frequency areas because they have maximum impact on musical signals—that's why they are sometimes known as "sweet spots." When an EQ knob is in its center detented position ("0"), it is having no effect. When it is moved right of center, the particular frequency area is being boosted; when it is moved left of center, the frequency area is being attenuated. In both the S8 and S6, the high and low EQ controls employ what is known as a *shelving* curve (where frequencies either above *or* below the specified area are affected) while the mid frequency controls employ what is known as a *bell* curve (where frequencies both above *and* below the specified area are affected)

S6 EQ section



Ten-band graphic master equalizer

The ten-band graphic master equalizer affects the overall output signal of the S8/S6. Its main function is to allow you to "tune" the device to the particular room environment you are in Perhaps its most important job is to enable you to eliminate ringing or feedback problems caused when a microphone is too close to a loudspeaker To accomplish this, start with all ten bands flat (that is, all ten sliders at their detented "0" center position) Then, one by one, raise each slider until you hear the feedback or ringing markedly increase. This allows you to identify the problematic frequency area (it will most commonly be one or more of the high mid-range or high frequency areas) When you've located the problem area(s), it's simply a matter of lowering that slider or sliders below the 0 point

until the ringing or feedback disappears. Don't lower the frequency area any further than you need to, or the quality of the overall sound may suffer If you don't specifically need to utilize the ten-band graphic master equalizer in a particular environment, leave it completely flat (all sliders at their center detented "0" position)

In most instances, the best way to approach equalization is to think in terms of which frequency areas you need to attenuate, as opposed to which ones you need to boost (boosting a frequency area also has the effect of boosting the overall signal; too much EQ boost can actually cause overload—with the accompanying Peak LED warning!) Be aware of the phenomenon of *masking*, where loud sounds in one frequency range obscure softer sounds in the same range; by cutting EQ "notches" in a loud signal, you can actually make room for a softer one to shine through. And try not to think of EQ as a miracle worker—no amount of equalization can put a singer in tune or remove the distortion from an overloaded input signal! The key is to get the signal right in the first place, by using correct gain structure and mic placement.

Although the specific EQ you will apply to a channel signal is very much a matter of personal taste, here are a few general suggestions: Boosting the low frequency of instruments such as bass drums or bass guitar will add warmth and make the sound "fatter"; conversely, you may want to attenuate the low frequency component of instruments such as cymbals, high-hats, and shakers so as to "thin" them out. The mid-range controls are particularly effective for vocals—attenuating the low-mid control can give a vocal performance more of an "FM-radio" feel and boosting the high-mid control can help a vocal cut through dense instrumentation Be careful not to boost high frequencies too much or you risk adding hiss to the signal, though just a touch can help add "shimmer" to an acoustic guitar, ride cymbal, or high-hat.

Using The Effects Sends and Returns

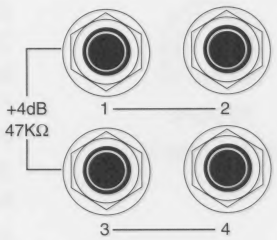
The two Effects sends provided by the S8 and S6 allow you to combine the signal from multiple channels and send the resulting mix to the rear panel Monitor output jack, to the internal reverb unit, or to external devices such as effects processors.

When an Effects send knob is at the "0" position, the signal is routed with unity gain (that is, no boost or attenuation) As it is turned clockwise from the 0 position, the signal is boosted; as it is turned counterclockwise from the 0 position, it is attenuated. Effects send 1 (Monitor) is *pre-fade*; that is, the level of the signal is determined solely by the input trim and is unaffected by the EQ settings or the position of the channel level control. In contrast, Effects send 2 (Reverb) is *post-fade*; that is, the level of the signal is determined by the input trim, the EQ settings, and the position of the channel level control (raising or lowering the level of the channel will affect the send level as well) It is particularly important to keep this distinction in mind when you connect external signal processors to the S8/S6 via either or both of the two Effects Send jacks on the rear panel.

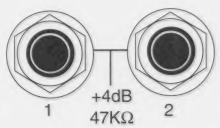
In addition, both the S8 and S6 offer a number of Effects returns (the S8 provides four while the S6 provides two) These allow you to return signal from outboard devices, either in stereo pairs or monophonically (many popular effects processors provide a single mono input but two stereo outputs) In practice, you'll probably want to use the Effects returns to bring in signal from connected effects processors. Because both the S8 and S6 are monophonic devices, the signal returned to the Effects return pair (1-2 in the S6) or pairs (1-2 and 3-4 in the S8) are automatically mixed down to mono. The front panel Effects return knob controls the input level of both signals mixed together

Effects Send knobs

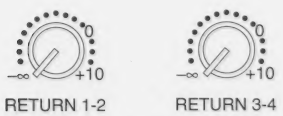
Effects Send jacks



S8 Effects Return jacks



S6 Effects Return jacks



S8 Effects Return knobs

S6 Effects Return knob

Using the Monitor Output and Internal Reverb

MON OUT

Monitor output jack

MONITOR

Monitor Level knob

REVERB

Reverb Level knob

Using the Monitor Output

In live performance, it is usually desirable to have onstage monitor speakers that allow the performer to clearly hear the music being played. Often, however, the performer requires a different mix than that being sent to the house speakers. The S8 and S6 Monitor output accommodates this need. A separate output jack on the rear panel allows an independent Monitor mix (sometimes called a *submix*) to be routed to an external amplifier/speaker system The blend of sounds sent to the Monitor mix is controlled by the Effects send 1 knob for each channel, with the master Monitor mix volume controlled by the main section Monitor Level knob. Because Effects send 1 is *pre-fade*, the Monitor mix is completely independent of the Main Level control setting, the 10-band graphic master EQ setting, the individual channel levels, and the individual channel EQ settings.

Using the Internal Reverb

Both the S8 and S6 contain a high-quality internal three-spring reverb unit that adds a quality called *ambience*; this is roughly equivalent to the diffuse kinds of echoes produced when you make a sound in a large hall or "live" room such as a tiled bathroom. To add reverb to a sound, simply raise the Effects send 2 knob for the channel you want to affect* and then slowly raise the Reverb Level knob in the front panel main section. For best signal-to-noise ratio, keep the Reverb level as low as possible while raising the individual channel Effects 2 sends as necessary (don't raise them too high, though, or distortion may result) If you are not using the S8/S6 internal reverb unit, keep the Reverb Level knob at its fully counterclockwise ("0") position so that no unwanted noise is added to the master output.

** Bear in mind that this will also route signal to any devices connected to the S8/S6 Effects Send 2 jack.*

Mixer / Pre Amp Section:

Total Harmonic Distortion (with 30 kHz LPF, trim center)	
S8	0.045%
S6	0.01%
Signal To Noise Ratio (both models, with 30 kHz LPF, trim center)	78 dB
Maximum Voltage Gain (both models)	
Mic in to Pre Amp out: Eff send 1, 2, mon out	62 dB
Line in to Pre Amp out: Eff send 1, 2, mon out	52 dB
Tape in to Pre Amp out: Eff send 2	10 dB
Tape Return to Pre Amp out	5 dB
Residual Noise (with 30 kHz LPF, VR min)	
Pre Amp out (S8)	-110 dB
Pre Amp out (S6)	-115 dB
Mon out (both models)	-100 dB
Trim Gain (both models)	40 dB
Tone Control	
S8	
High (10 kHz)	±15 dB
2.5 kHz	±12 dB
500 Hz	±12 dB
Low (80 Hz)	±15 dB
S6	
High (10 kHz)	±15 dB
Mid (1 kHz)	±12 dB
Low (80 Hz)	±15 dB
Graphic Equalizer (both models)	
(30, 64, 125, 250, 500 Hz, 1, 2, 3, 5, 10 kHz)	±15 dB
Peak LED	5 dB before clipping
Tape Input Sensitivity (-10 dB)	300 mV
Headphone (S8)	20 mW (8 ohms)

Power Amp Section:

	@ 4 ohm	@ 8 ohm
Rated Output Power (1 kHz)		
S8	300 watt	220 watt
S6	200 watt	130 watt
Total Harmonic Distortion (with 30 kHz LPF)		
S8		0.0045%
S6		0.0035%
Signal To Noise Ratio (with 30 kHz LPF)		
S8		105 dB
S6		110 dB
Frequency Response (-1 dB)		10 Hz - 28 kHz
Input Sensitivity / Impedance		1.2 V / 10 kOhm
Residual Noise (VR min)		74 dB typical
Idle Current (across the 0.47Ω emitter resistor)		less than 7 mA
DC Offset Voltage		0 ± 50 mV

General:

Dimensions (W x D x H)	480 x 125 x 280 mm	
Weight		
S8	31 lb • 14 kg	
S6	29 lb • 13 kg	
Power Requirements	115 V AC 50/60 Hz	230/240 V AC 50/60 Hz
Power Consumption (1/3 power)	220 w	340 w

Notes

Notes

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Samson cares about the environment